

Multi-Center Traffic Management Advisor: Operational Test Results

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Background

The Multi-Center Traffic Management Advisor (McTMA) is a research prototype system which seeks to bring time-based metering into the mainstream of air traffic control (ATC) operations. Time-based metering is an efficient alternative to traditional air traffic management techniques such as distance-based spacing (miles-in-trail spacing) and managed arrival reservoirs (airborne holding). While time-based metering has demonstrated significant benefit in terms of arrival throughput and arrival delay, its use to date has been limited to arrival operations at just nine airports nationally. Wide-scale adoption of time-based metering has been hampered, in part, by the limited scalability of metering automation. In order to realize the full spectrum of efficiency benefits possible with time-based metering, a much more modular, scalable time-based metering capability is required. With its *distributed metering architecture*, multi-center TMA offers such a capability.

Test procedure

This paper presents the results of a field test conducted during live ATC operations in November 2004 to validate multi-center TMA's *distributed metering architecture*, the key innovation of this research initiative. In the test, multi-center TMA was used by traffic management coordinators at four Air Route Traffic Control Centers in the northeast corridor to generate departure release advisories for flights bound for Philadelphia International Airport from points of origin up to 450 miles away. Participants included management and union representatives from the traffic management units (TMUs) at Boston, Cleveland, New York, and Washington Centers, Philadelphia TRACON, and the ATC System Command Center. Only departure times were metered; no airborne metering was conducted. Field test methods, data, observations and conclusions are presented.

Results and observations

The evaluation successfully demonstrated the advantages of the McTMA departure metering capability over the FAA's current techniques. Airborne delay was significantly reduced during the test period, with no penalty in gate-to-gate delay (ref. Figures 1 and 2). During several periods at PHL when airborne holding is routinely encountered, no such holding was observed when McTMA was in use (ref. Figures 3 through 6). The figures also indicate a more efficient flow to the runway threshold: less vectoring inside the terminal area, a shorter final approach segment, and better inter-arrival spacing. The test validated the McTMA distributed metering architecture which will enable time-based metering to be applied more generally to departures, arrivals, and en route traffic within and beyond the northeast corridor.

The results further suggest that, using the shared information presented by multi-center TMA, traffic management coordinators at multiple facilities will be able to effectively identify and coordinate more efficient traffic management solutions for the heavily congested arrival airspace to Philadelphia.

Conclusion

Based on the results of this field test activity, the FAA has contracted with Computer Sciences Corporation to integrate the key McTMA prototype technologies into the operational TMA system for installation across the NAS in 2006.

Figures

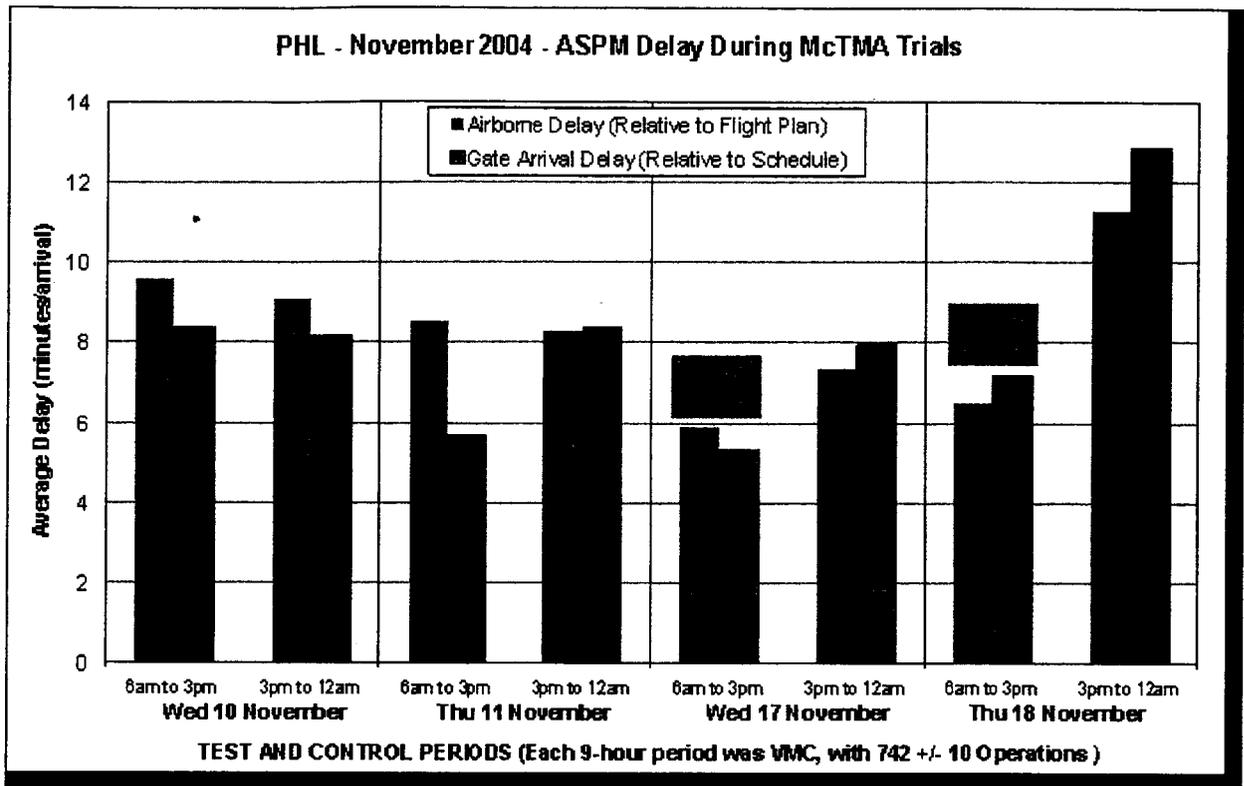


Figure 1. ASPM analysis of PHL performance during test and control periods

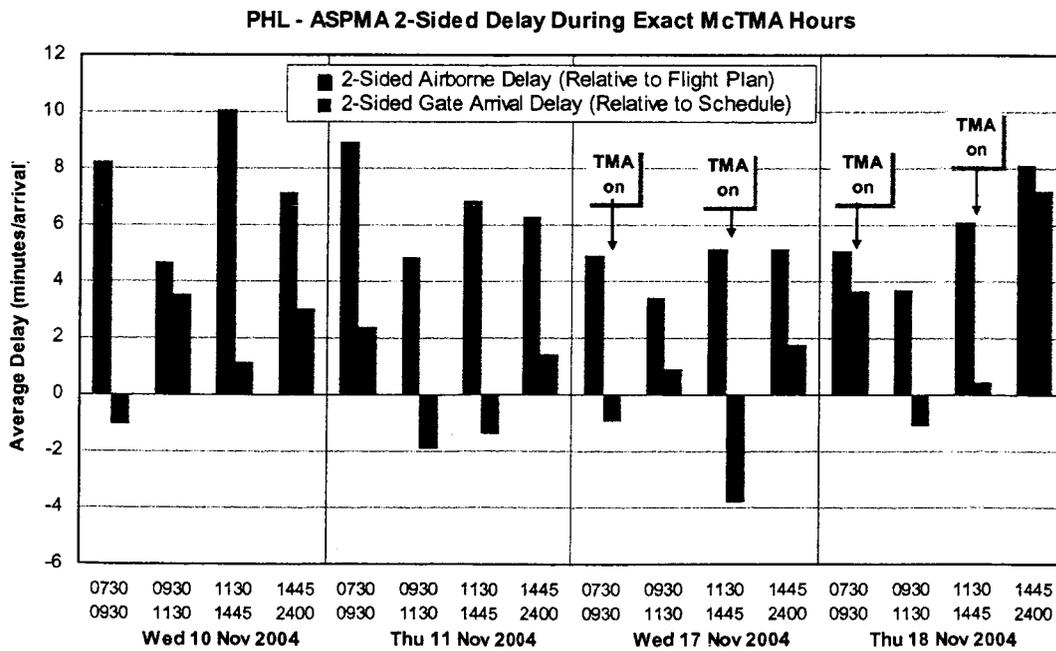


Figure 2. PHL delay during November 2004 McTMA trials

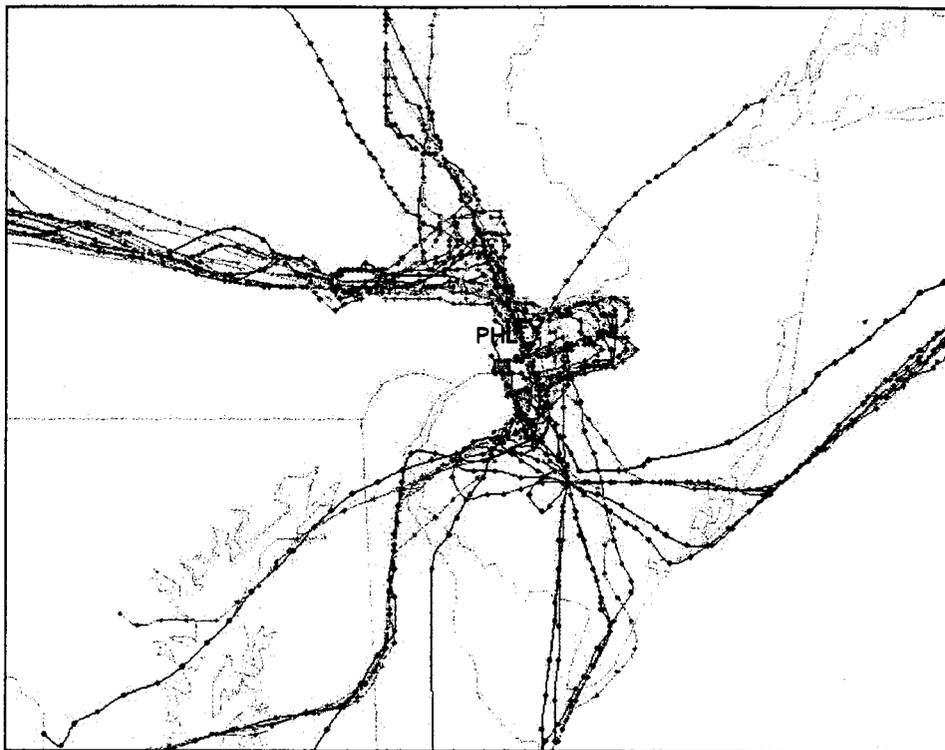


Figure 3. PHL arrivals during control period, 0800-0900 EST on 11 November 2004

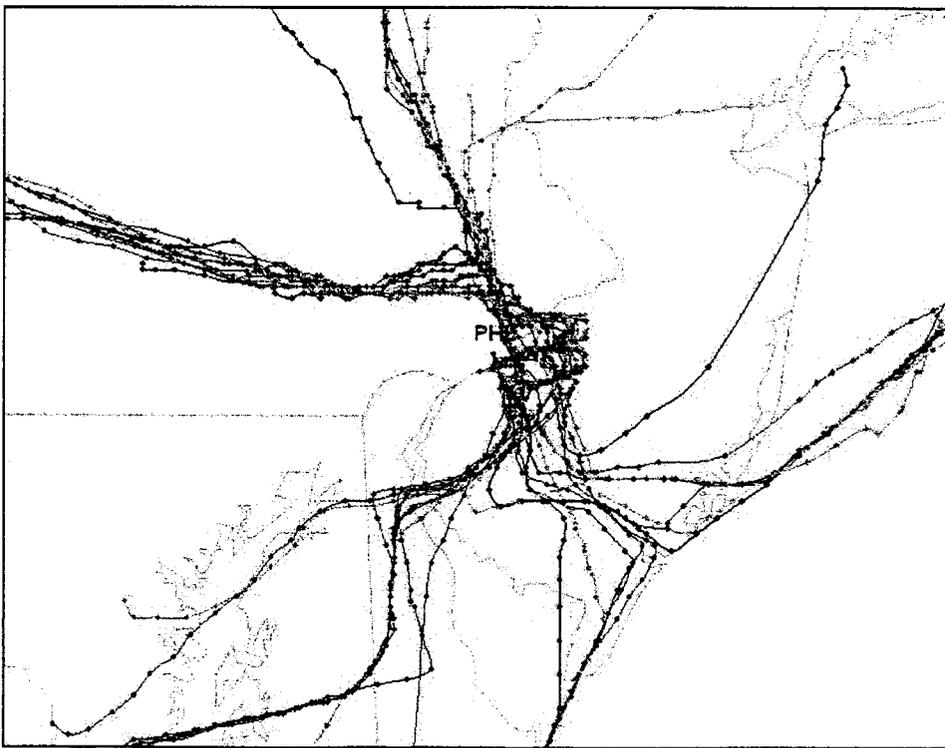


Figure 4. PHL arrivals during test period, 0800-0900 EST on 18 November 2004



Figure 5. PHL arrivals during control period, 0850 EST on 11 November 2004



Figure 6. PHL arrivals during test period, 0850 EST on 18 November 2004

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